

## What is Claimed:

- 1                   1.     A method of classifying radar emitters comprising the steps of:
  - 2                               (a)     receiving a plurality of signals from the radar emitters;
  - 3                               (b)     generating data components for each signal received  
4                               from the radar emitters;
  - 5                               (c)     forming multi-dimensional samples using the generated  
6                               data components; and
  - 7                               (d)     sorting the multi-dimensional samples into a plurality of  
8                               data clusters, based on their respective proximity to the data clusters, each  
9                               data cluster representing a classification of a radar emitter.
- 1                   2.     The method of claim 1 wherein
  - 2                               step (b) includes generating pulse data descriptors (PDWs) during a  
3                               predetermined interval of time.
- 1                   3.     The method of claim 2 wherein
  - 2                               generating the PDWs includes generating at least radio frequency (RF)  
3                               data and pulse width (PW) data, during the predetermined interval of time for each  
4                               received signal.
- 1                   4.     The method of claim 1 wherein

2                    step (c) includes forming vectors, each vector comprised of a sum of  
3   weighted PDWs.

1                      5. The method of claim 4 including

2 adaptively weighting each PDW, based on electronic warfare (EW)  
3 intelligence of signals expected to be received from the radar emitters.

1                    6.        The method of claim 4 including

normalizing each vector, based on an average vector of all the vectors  
formed in step (c) during a predetermined interval of time.

1                    7.        The method of claim 1 wherein

step (d) includes assigning a multi-dimensional sample to a data cluster, based on a Euclidean distance between the multi-dimensional sample and a center of the data cluster.

1                    8.        The method of claim 7 including

forming the center of the data cluster as a mean vector of a set of multi-dimensional samples assigned to the data cluster.

1                    9.        The method of claim 8 including

2 re-assigning a multi-dimensional sample from the data cluster to  
3 another data cluster, based on a sum of squared errors resulting from the set of  
4 multi-dimensional samples assigned to the data cluster.

1 10. The method of claim 1 wherein

2 step (d) includes sorting the multi-dimensional samples using an  
3 ISODATA (iterative self-organizing data analysis technique) computer algorithm.

1 11. A system for classifying radar emitters comprising:

2 a receiver for receiving a plurality of signals from the radar emitters,  
3 and

4 a processor coupled to the receiver for

5 (a) generating data components for each signal received from  
6 the radar emitters,

7 (b) forming multi-dimensional samples from the generated data  
8 components; and

9 (c) sorting the multi-dimensional samples into a plurality of  
10 data clusters, based on their respective proximity to the data clusters,  
11 each data cluster representing a classification of a radar emitter.

1 12. The system of claim 11 wherein

2           the data components are generated as pulse data descriptors (PDWs)  
3   during a predetermined interval of time, and

4           each PDW includes at least radio frequency (RF) data and pulse width  
5   (PW) data.

1           13.   The system of claim 12 wherein

2           each PDW is adaptively weighted, based on electronic warfare (EW)  
3   intelligence of signals expected to be received from the radar emitters.

1           14.   The system of claim 11 wherein

2           the processor assigns a multi-dimensional sample to a data cluster,  
3   based on a Euclidean distance between the multi-dimensional sample and a center of  
4   the data cluster.

1           15.   The system of claim 14 wherein

2           the center of the data cluster is formed as a mean vector of a set of  
3   multi-dimensional samples assigned to the data cluster.

1           16.   The system of claim 11 wherein

2           the processor sorts the multi-dimensional samples using an ISODATA  
3   (iterative self-organizing data analysis technique) computer algorithm.

1                   17.    A machine readable storage medium containing a set of  
2 instructions for a computer, the set of instructions implementing the following steps:

3                           (a)    processing a plurality of signals received from a  
4 receiver;

5                           (b)    generating data components for each signal received  
6 from the receiver;

7                           (c)    forming multi-dimensional samples using the generated  
8 data components; and

9                           (d)    sorting the multi-dimensional samples into a plurality of  
10 data clusters, based on their respective proximity to the data clusters, each  
11 data cluster representing a classification of a radar emitter.

1                   18.    The medium of claim 17 wherein

2                           step (b) includes generating pulse data descriptors (PDWs) during a  
3 predetermined interval of time, and

4                           each of the generated PDWs includes at least radio frequency (RF)  
5 data and pulse width (PW) data.

1                   19.    The medium of claim 17 wherein

2                   step (d) includes assigning a multi-dimensional sample to a data  
3                   cluster, based on a Euclidean distance between the multi-dimensional sample  
4                   and a center of the data cluster.

1                   20.     The medium of claim 17 wherein

2                   step (d) includes sorting the multi-dimensional samples using an  
3                   ISODATA (iterative self-organizing data analysis technique) computer algorithm.